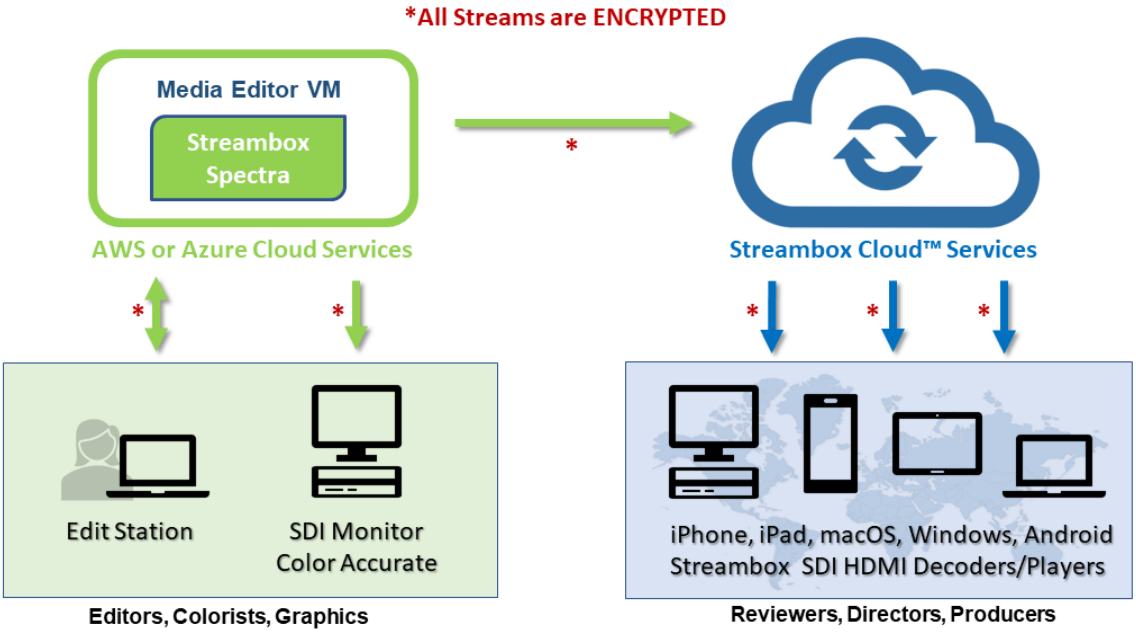
Streambox® Spectra™

for Avid Media Composer on Windows

Quick Start Guide



Release Review January 2021

Note: This document reflects the current feature-set which may change without notice. We will attempt to keep all users up to date on any such changes.

Document History:
January 2021. RR2. For Ver. 0.1.53 or greater. Added setup for multi-channel audio, a troubleshooting section, and updated images for updated UI. DB, LN

Contents

Introduction

Streambox Spectra is a software-based encoder that delivers near lossless streaming. Spectra runs as a device plug-in for video edit software that can be used locally or on a cloud-based setup.

Video technology providers, such as Avid Media Composer[1] and others, are now offering virtual cloud-based applications and workflows via a PCoIP interface. There are two main limitations to this approach, 1) lack of sufficient resolution and color accuracy for critical review and color grading, and 2) long latencies for high-resolution video.

Using Spectra, an editor or colorist can deliver real-time, high-quality video for review to almost any computer or mobile device, anywhere in the world, via private or public networks. Spectra plus Streambox Cloud Services provides one-to-many global connectivity with no compromise in quality, effectively creating multiple virtual screening rooms.

Prerequisites

Uninstall Previous Betas

If a Spectra beta release is installed on the unit, uninstall it first following the appropriate method. See Uninstalling Spectra Beta. Subsequent installs with post-beta releases will not require an uninstallation.

Required OS/Hardware and Software

- Windows 10 (64-bit) on a 6 Core (8 to 24 cores recommended) system, 16GB or greater RAM (32GB recommended for UHD/4K), and high-performance GPU recommended
- Avid Media Composer

Overview

Streambox Spectra for Avid Media Composer has three main components:

- Spectra Encoder Services (ACT-L3, ACT-L5) – encoding engine
- Spectra Avid Open I/O plugin – plugin to communicate between Avid Media Composer and Spectra Encoder Service

[1] https://www.avid.com/media-composer

- Spectra Control Panel – Utility to configure and control Spectra Encoder Service

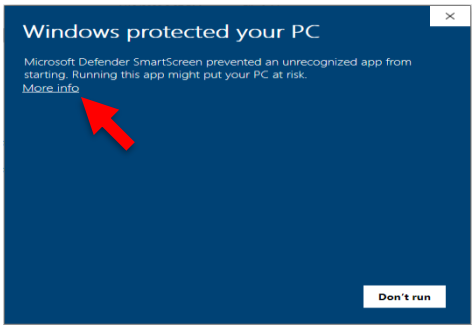
Release Review Notes

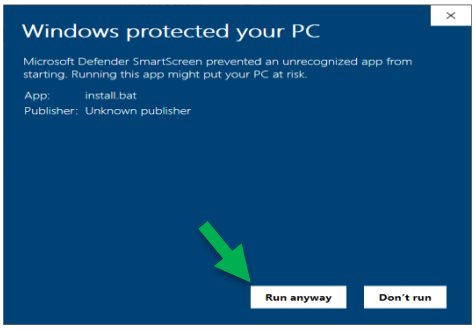
Note 1: S/W Activation is required for Spectra Encoder Service

Note 2: Sample settings are included and should provide good quality streams but are not optimized for specific geographic locations or network capacity. Please contact Streambox for guidance with initial setup.

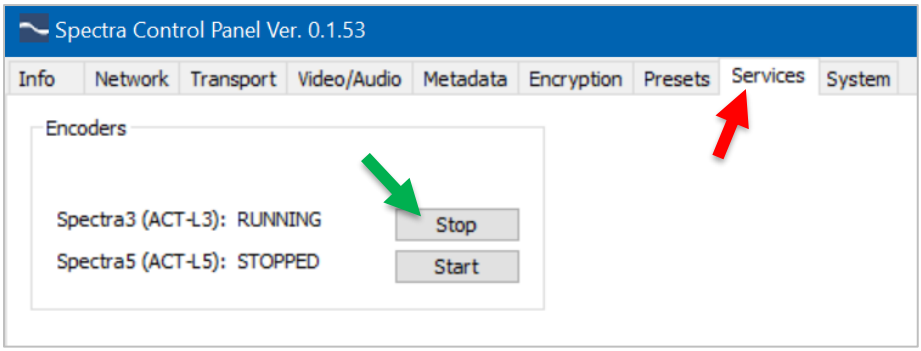
Installation

NOTE: Since this is a Release Review installation, Windows and Security Software may at times attempt to restrict its running or installation. In these cases, you can override these protections. For example, you may get the following Windows warning (right); then click 'More info' (red arrow) and then 'Run anyway' (green arrow).

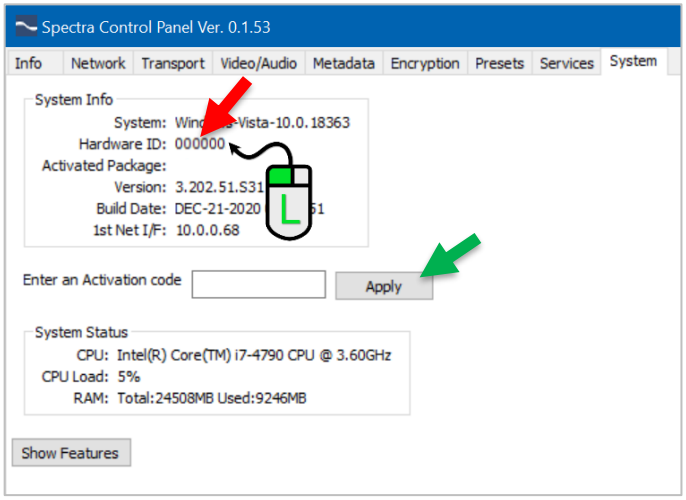




1. Download and install Spectra
2. Open the download folder (zip file) and double-click the installer file (spectra.exe).
3. After installation is complete, you can find the Spectra Control Panel shortcut on the Start menu, under the Streambox folder.
   a. Run '**Spectra Control Panel**'
4. Start **Spectra3** Service
   Note: You may skip this step if Spectra3 is already Running.
   From the 'Service' tab (red arrow), click the 'Start/Stop' button for Spectra3 (green arrow).



5. Activate Spectra
   Note 1: You may skip this step if Spectra is already activated
   - Obtain Hardware ID: open 'System' tab (look under System Info, red arrow, click to copy to clipboard)
   - Email Hardware ID to:
     beta@streambox.com
   - Please ask to activate as:
     "Chroma4K" or "ChromaHD"
   - Enter Activation Code and click 'Apply' (green arrow)

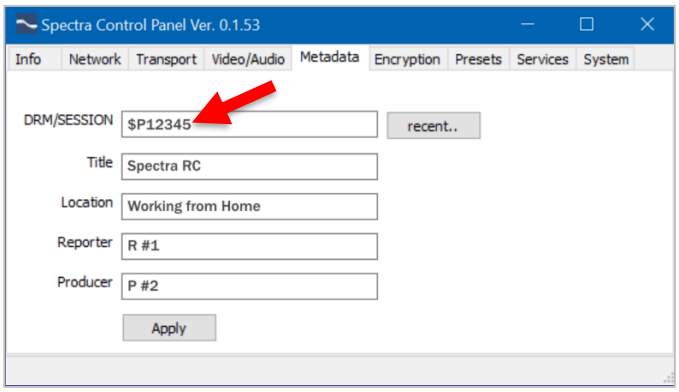


   Note 2: You may click the 'Show Features' button to see what has been activated. Some features listed (e.g. Decoder) are not supported by the software, even if activated.

Session DRM

Spectra utilizes Streambox Sessions to simplify connectivity between the primary user and any number of end users (reviewers). You will need to set up a Session, Set the Session DRM, and set the Server IP:

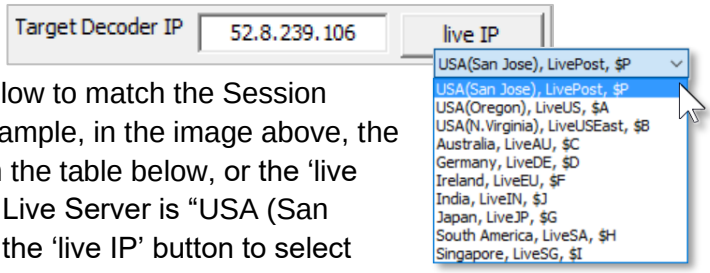
1. Setup or choose a current Session (remember, only one encoder can stream to an individual Session at a time). If you are not familiar with Streambox Sessions, please refer to the Sessions Quick Start Guide.



2. Set the Session DRM.
   Under the 'Metadata' tab, enter the Session DRM (red arrow). If you have previously entered a DRM, it will appear under the 'recent…' button

   The other values in Metadata are optional but are good practice and should help to identify the stream

3. Select the Target Decoder IP (live IP) under the **Network** tab to match the Session DRM prefix ($_). Use the table below to match the Session DRM prefix ($ plus next character). For example, in the image above, the sample Session DRM is $P12345, so from the table below, or the 'live IP' dropdown to the right, you see that the Live Server is "USA (San Jose), LivePost, $P". You can simply click the 'live IP' button to select this server (or manually enter the IP address).



Note: Remember to click 'Apply...' to save/initiate any changes.

Name	Public IP Address	Location
Live**US**.streambox.com	52.25.129.48	USA (Oregon), LiveUS, **$A**
Live**USEast**.streambox.com	54.83.19.155	USA (N. Virginia), LiveUSEast, **$B**
Live**AU**.streambox.com	52.62.2.246	Australia, LiveAU, **$C**
Live**DE**.streambox.com	54.93.179.19	Germany, LiveDE, **$D**
Live**EU**.streambox.com	54.247.100.52	Ireland, LiveEU, **$F**
Live**JP**.streambox.com	52.69.71.156	Japan, LiveJP, **$G**
Live**SA**.streambox.com	54.233.86.10	South America, LiveSA, **$H**
Live**SG**.streambox.com	52.76.243.157	Singapore, LiveSG, **$I**
Live**IN**.streambox.com	52.66.83.26	India, LiveIN, **$J**
Live**Post**.streambox.com	52.8.239.106	USA (San Jose), LivePost, **$P**

Ref: https://streambox.force.com/support/s/article/streambox-cloud-server-ip-addresses

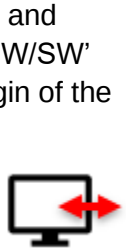
IP Skip (use only if needed)

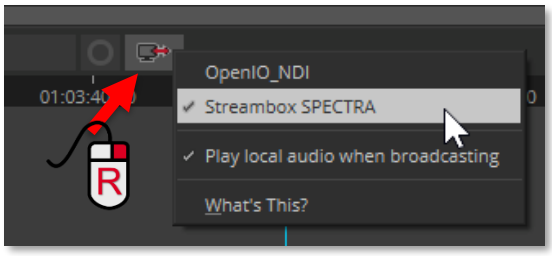
Spectra will automatically be assigned an IP address. If for some reason this assigned IP address is inappropriate or in conflict, you can force Spectra to skip it by adding the IpSkip0="<IP to Skip>" to the settings.xml file found in the '\Program Files\Streambox\Spectra\' folder. For this change to take place, you must first Stop Spectra Service (in the Service Tab), make changes to settings.xml, and then Start Spectra Service.

Setting up Spectra in Avid Media Composer

1. Set Avid output to 'Streambox SPECTRA' and 'Play local audio…' by right-clicking the 'HW/SW' switch (red arrow) located on the top margin of the timeline.

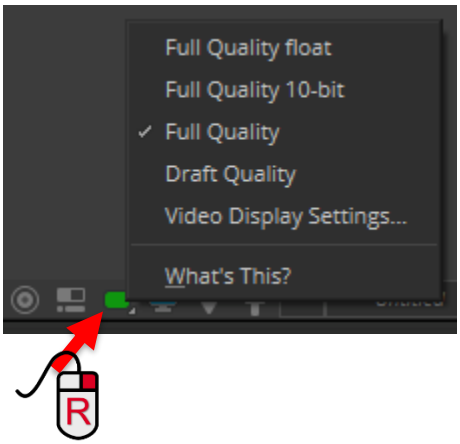
Note: Left-clicking the HW/SW switch will turn the stream ON/OFF (make sure the double-headed arrow is displayed when you want to stream the output).





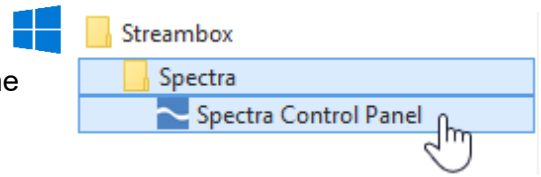
2. Set the output quality by right-clicking the 'Video Quality Menu' (lower left panel on timeline, red arrow). It must be **set to 'Full Quality' for Spectra to work correctly**.

   Note: If you are using the Spectra5 (ACT-L5) service (see Start/Stop Spectra Services below) and working on a 10-bit project, you will want to select 'Full Quality 10-bit'. If you are working on a 12-bit project, use 'Full Quality float'.



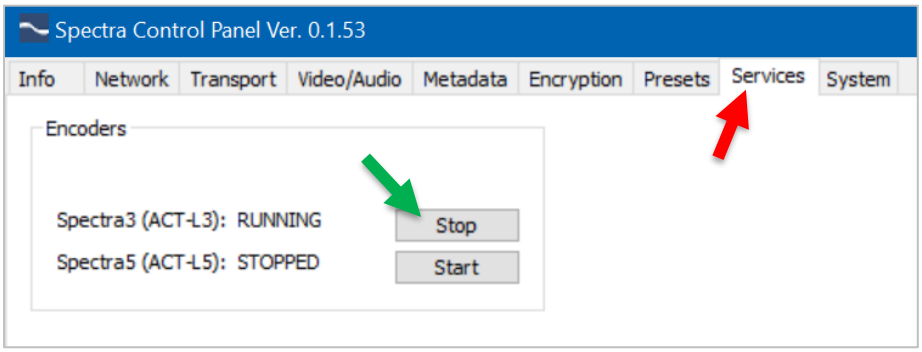
Using the Spectra Panel

You used the Spectra Panel during installation, let's take a closer look. If it is closed, you can reopen it: Click the 'Spectra Control Panel' item under the Streambox folder on the Start menu.



Start/Stop Spectra Services

The Spectra service refers to the video encoder. You have two flavors, ACT-L3 and ACTL5. ACT-L5 supports everything that ACT-L3 does plus 10 and 12-bit color depth, HDR, and the 4:4:4 color profile; ideal for colorist review. For initial review, we recommend starting with ACT-L3 since it is optimized for lower bandwidth and Rec.709. Open the Service tab (red arrow) and click on the



Start/Stop switch associated with ACT-L3 (green arrow). Make sure the 'RUNNING' status is displayed.

NOTE: The Spectra service does not terminate until the user stops the service by click the Stop/Start switch button.

Stream Settings

There are many parameters that can be used to fine-tune a video stream. As a starting point, we provide some basic Presets (see Presets tab section below). If needed, below are links for those who want a more detailed review.

Transport, LDMP:

https://streambox.force.com/support/s/article/advanced-ldmp

Stream latency:

https://streambox.force.com/support/s/article/Guide-to-Reducing-Stream-Latency

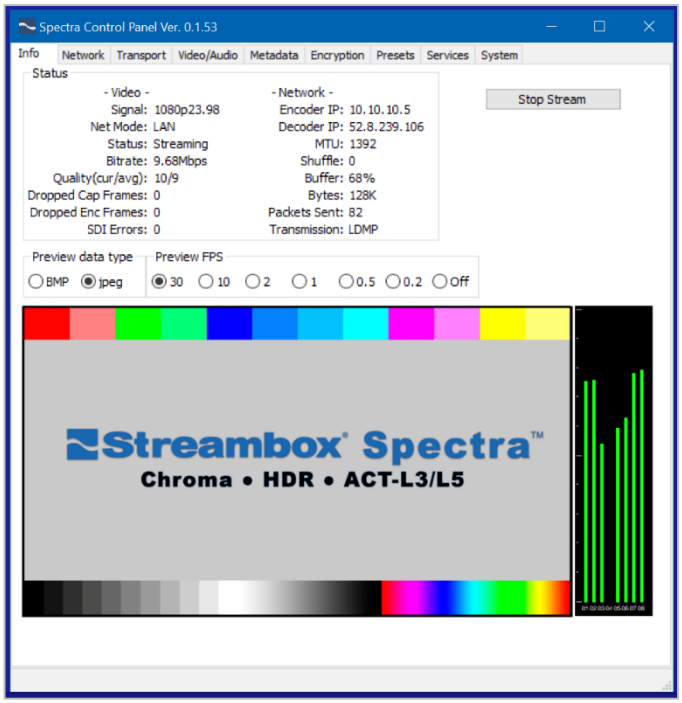
Sessions:

https://streambox.force.com/support/s/article/Streambox-Cloud-with-Sessions-Workflow-Best-Practices-Part-1
https://streambox.force.com/support/s/article/Streambox-Cloud-with-Sessions-Workflow-Best-Practices-Part-2
https://streambox.force.com/support/s/article/Streambox-Cloud-with-Sessions-Workflow-Best-Practices-Part-3
https://streambox.force.com/support/s/article/Streambox-Cloud-with-Sessions-Workflow-Best-Practices-Part-4

Info tab

The ‘Info’ tab provides the stream status, a ‘Start/Stop Stream’ switch button, a Preview panel, and audio meter.

You can preview a facsimile of what is being delivered to the Spectra Encoder by setting the ‘Preview FPS’ (frames per second) selector to a value other than Off.



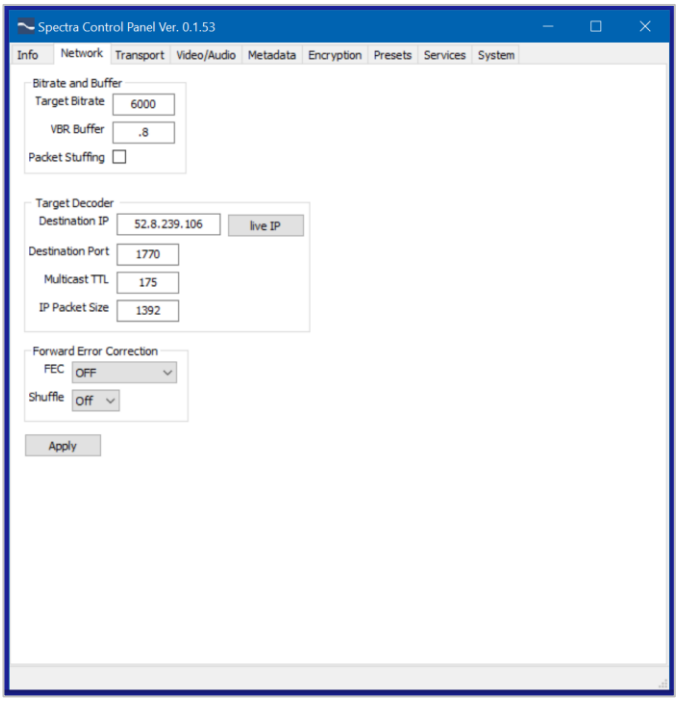
Network tab

The Network tab is where you set the target bitrate, buffer size, and target decoder settings.

Note 1: The Target Decoder IP must match the Server where the Session was created. See Session DRM above.

Note 2: The other values here are good starting points for HD (you can always increase the Target Bitrate to 8000 or more if your network supports the upload rate).[2] Rates up to 80 Mbps (80000) have been tested for UHD, 10-bit streams.

Note: Remember to click 'Apply' to save/initiate any changes.



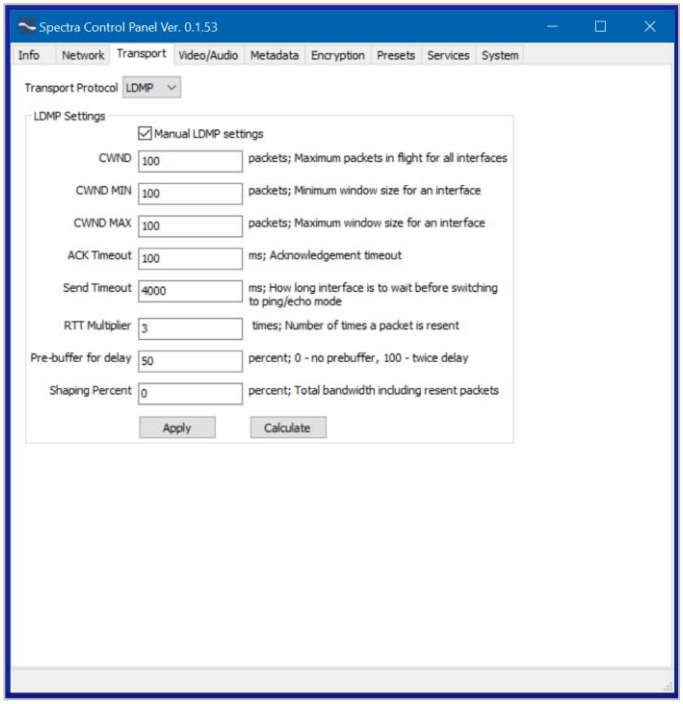
Transport tab

The Transport tab is where you set the LDMP settings. If you are not familiar with these settings, please refer to the Advanced LDMP article.

The settings shown here are a good starting point for an HD stream. See Presets tab section below for more options.

If you require fine tuning, feel free to contact Streambox Support.

Note: Remember to click 'Apply' to save/initiate any changes.



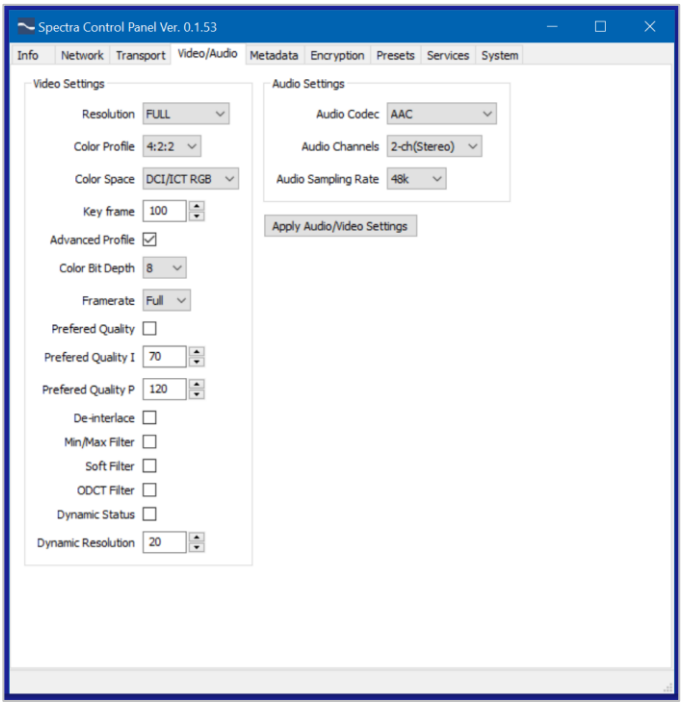
[2] Your network upload rate should support at least the Target Bitrate + 20% to ensure a stable stream.

Video/Audio tab

The Video/Audio tab is where the properties of the video stream are defined, e.g., Resolution, Color Profile, Audio Codec, Audio Channels (mono, stereo, … 16-ch), etc.

The settings shown here are a good starting point for an HD stream.

Note: Remember to click ‘Apply...’ to save/initiate any changes.



Metadata tabs

The Metadata tab was covered above under Session DRM.

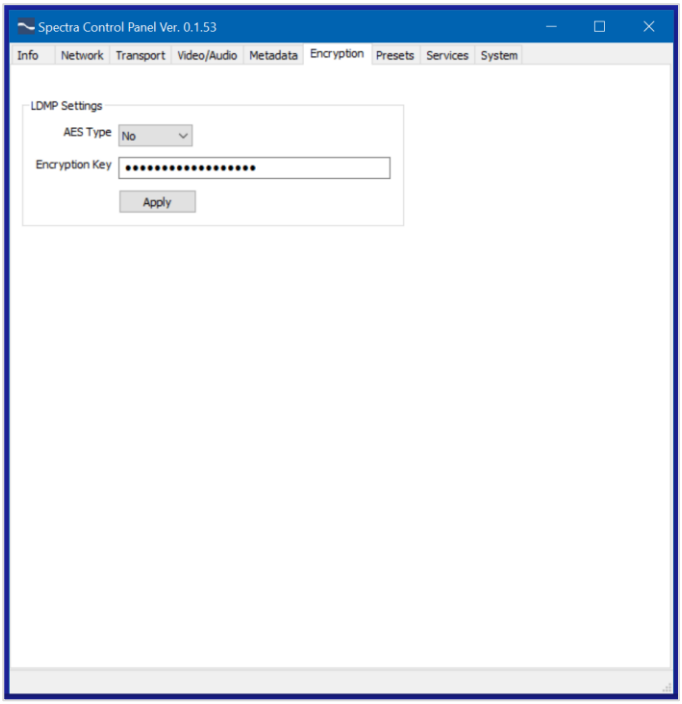
Encryption tab

The Encryption tab is where the user can set the key and initiate encryption (AES 128-bit encryption is supported by default, 256-bit encryption requires additional activation with restrictions). If encryption is initiated, a matching key must be used on any decoder/player to display the stream.

Note 1: Encryption does not increase stream latency.

Note 2: Remember to click ‘Apply’ to save/initiate any changes.

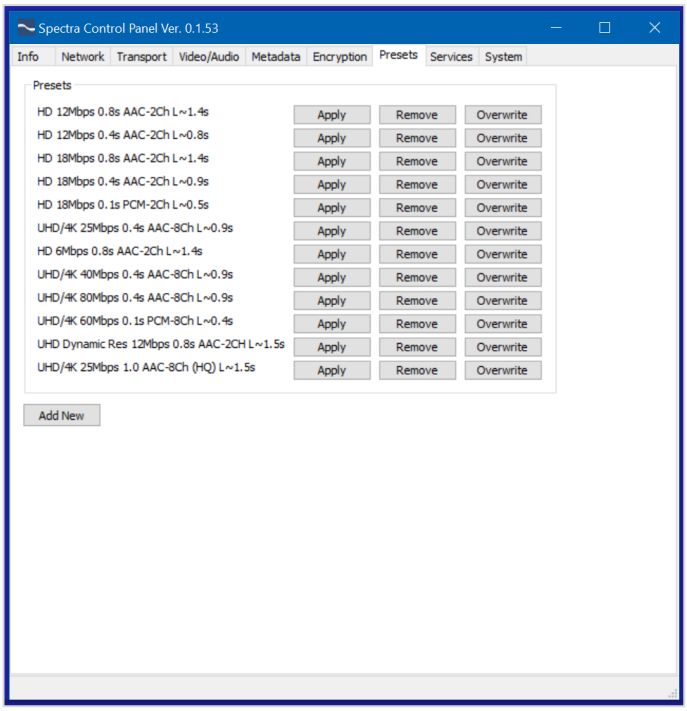
Note 3: It is recommended that encryption keys should contain at least 11 alphanumeric characters with both upper and lower case.



Presets tab

The Preset tab is where presets for Encoding, Bitrate, Latency, Network, FEC, Video/Audio settings, and Metadata values can be defined. To initiate a preset, click ‘Apply’ that is associated with the desired preset.

To create your own presets, set the values/properties you desire on the various tabs and then click ‘Add New’ to create a new preset or ‘Overwrite’ to replace a current preset.



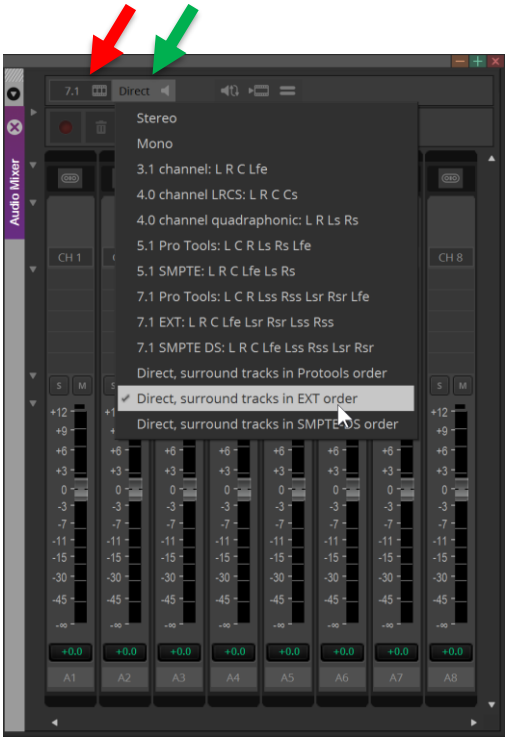
Services & System tabs

The Services and System tabs were covered above under Installation.

Multi-Audio Channels

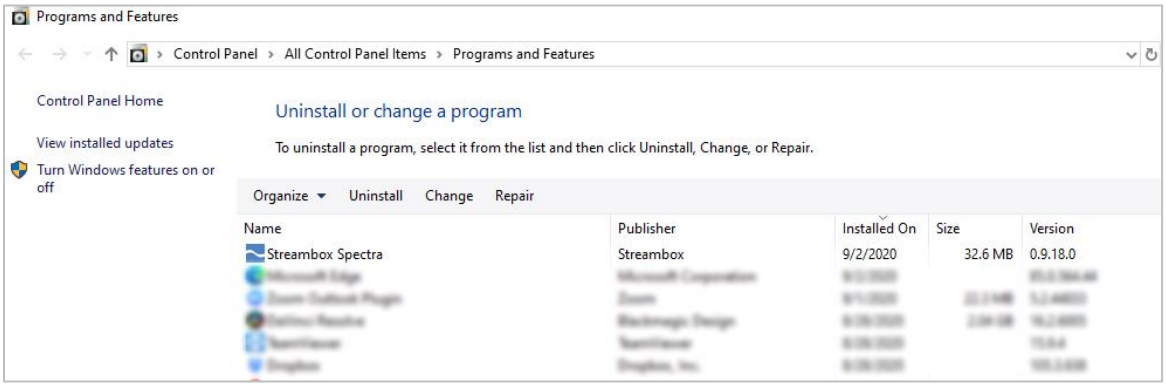
Streambox Spectra supports mono to 8 channels of audio (mono, stereo, quadraphonic, 5.1, and 7.1) output from Avid Media Composer. To setup audio channels:

1. Open the Audio Mixer (Tools menu) in Media Composer
2. From the Sequence Mix Format dropdown (red arrow), select Stereo, 5.1, or 7.1 respectively
3. From the Mix Mode Selection dropdown (green arrow), select a specific mode or ‘Direct, surround tracks in EXT order’ (the latter should output 1-for-1 to Spectra).
4. Select the Video/Audio tab in the Spectra Control Panel.
5. Select Audio Codec AAC or PCM.
6. Select Audio Channels (Mono for 1-ch, Stereo for 2-ch, 4-ch for Quadraphonic, 5.1ch for 5.1 or 6-ch, and 8-ch for 7.1)



Uninstalling Spectra Beta

1. Quit Avid Media Composer if running
2. Stop Spectra service (if running)
3. Close Spectra Control Panel
4. Open the 'Programs & Features' list from the Windows' Control Panel
5. Double-click 'Streambox Spectra'



Uninstalling Early Spectra Beta Releases

If you installed the Spectra beta before the September 2 release you will have to do a manual un-install.

1. Right-click on 'uninstall.bat' (in C:\Program Files\Streambox\Spectra\) and select "Run as administrator" 

This will open a command window to run the uninstaller. You will be requested to press a key to continue the process throughout the uninstallation.
2. After uninstalling is complete, delete the 'Spectra' folder and all files within.

Troubleshooting

If you are experiencing issues installing Spectra or the stream quality is not as expected, feel free to contact our Support team (see below). Below is a list of known issues.

1. Both AJA and Blackmagic plug-ins for Avid Media Composer conflict with the Spectra plug-in. Renaming the AJA and Blackmagic ACF extensions to ACFX should fix this issue.
2. Media Player for iOS and macOS (Catalina, Big Sur) fully support all streams from Spectra. The legacy Media Player for Windows only supports ACT-L3 streams.
3. Video streaming requires stable network connectivity, so where possible a direct LAN connection is preferred (though a strong WiFi or Mobile connection can be acceptable, especially for HD).
4. If at first you don't succeed, feel free to contact our Support Team.

Specifications

- HD: 1920x1080p, 1920x1080PsF,1920x1080i, 1440x1080i, 1280x1080i, 960x1080i, 1280x720p, 960x720p, 800x720p, 640x720p
- 2K DCI: (2048x1080) 23.98, 24 fps
- UHD (3840 x 2160) 23.98 ,24, 25, 29.97, 30 fps
- 4K DCI (4096 x 2160) 23.98 and 24 fps
- Audio Codec: 8-ch PCM and AAC, CELP, GSM frequency 44.1/48 KHz
- Bitrate: 2 to 80 Mbps (depending on network upload capacity)
- Color: RGB, XYZ, YUV 4:4:4, 4:2:2, 4:2:0
- ACT-L3 codec:
  8-bit depth, Rec.709, P3
- ACT-L5 codec:
  8, 10, 12-bit depth, HDR, Rec.709, Rec.2020, P3

Contact Information

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